



Africa 2001





Who saw what. This computer generated mosaic map uses Fred's actual images of the 2001 eclipse to show the maximum eclipse experienced at locations across all of Africa. It was based on Figure 2 in Fred Espenak's eclipse bulletin (NASA TP 1999-209484). The rotational orientation of each image in the mosaic is purely for aesthetic effect.

Technical details: Mosaic created with custom software. Stereographic projection. Telescope/camera setup: an 80mm F/5 refractor on manual altaz tripod, with 2x Barlowed 25mm eyepiece projection into a Canon G1 digital camera. Partial phases were captured with an exposure of 1/200 second F8. Diamond rings are a composite of two images: digital camera exposures of 1/15 and 1/400 second at F8. Totality image is a composite of three images: digital camera exposures were 1/30 F2.5, 1/250 F2.5, and 1/500 F5.6, log brightness scaling and an unsharp mask were applied to emphasize details in the corona.

Africa 2001

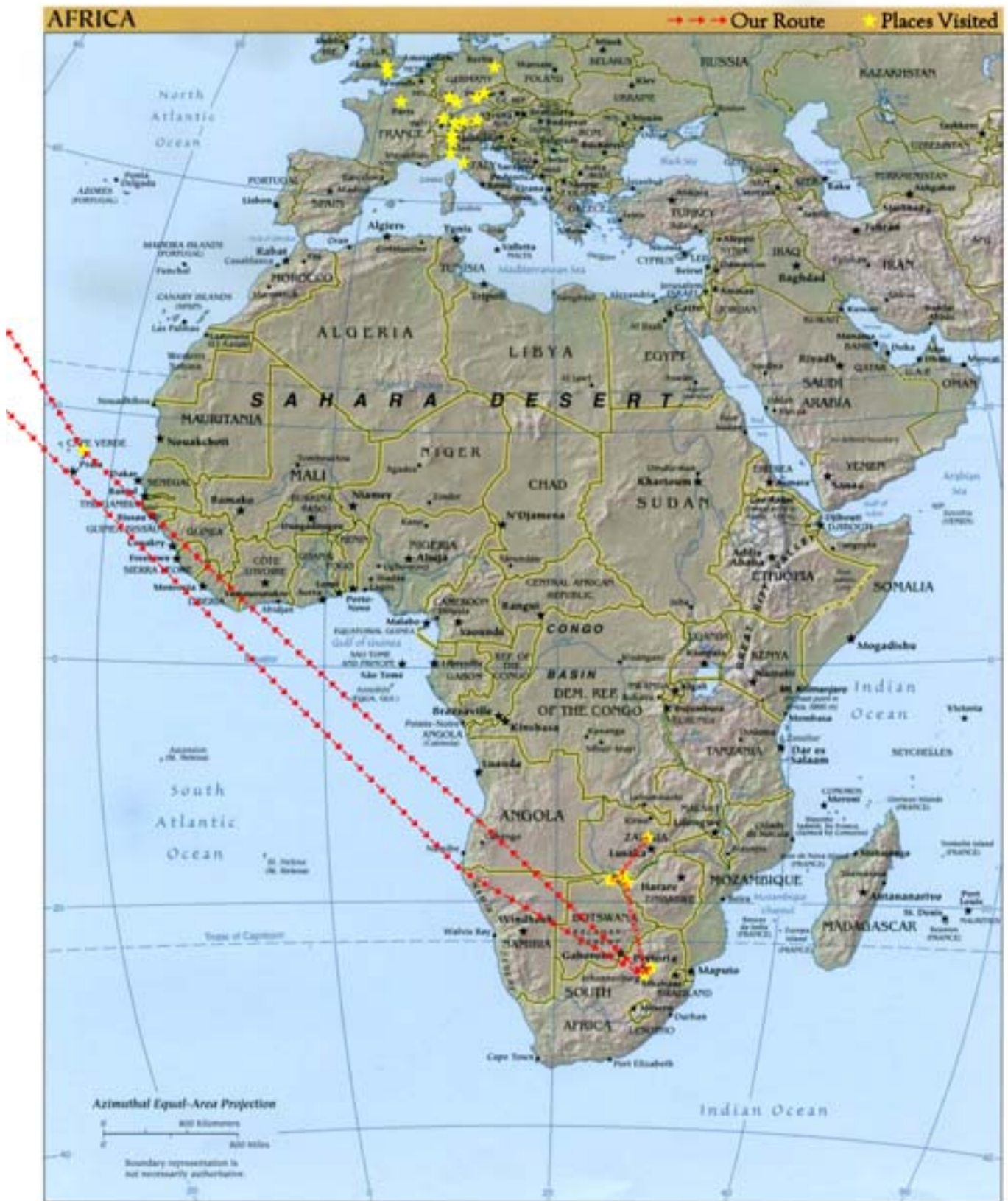
The Ultimate Vacation
by Fred Bruenjes and Monica Bruenjes

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Visit <http://www.moonglow.net/eclipse/> for more about the trip.

Map of Africa



Introduction

On June 21, 2001, there was a Total Solar Eclipse visible from Southern Africa. We, Fred and Monica Bruenjes (Monica is Fred's brother, no wait... Monica is Fred's SISTER!) travelled there from San Diego, California to see the eclipse and go on safari.

Just as the Sun, Moon, and Earth aligned to create the total solar eclipse, finances, work schedule, and interests finally aligned, allowing us to go and see the eclipse. This was our first total solar eclipse, something that I (Fred) had been waiting a long time to see.

I wasn't comfortable with arranging the trip myself as I was not familiar with the countries or what to expect. I signed up for a tour offered by Astronomical Tours, a travel agency designed for amateur astronomers like me. Many tours book full up to a year in advance, and so we were lucky to get in on a cancellation. The trip took weeks to prepare for, as we needed to determine what to bring, to purchase any needed items, to get shots, and to obtain visas.

This is the story of our trip, told in chronological order by me (Fred) with comments from Monica.

Day 1: Saturday June 16th, 2001. San Diego to New York

We left San Diego in the afternoon after some frantic packing. To the right you can see most of the equipment and supplies laid out, ready for packing into bags and suitcases. No, we didn't take a



sewing machine, we just needed to mend some items before leaving. At left is the plane we took across the USA to New York.

While flying across the country we saw some neat sights, like Meteor Crater (left), and a large thun-



derstorm system. Of course the storm was right between us and where we needed to go. The storm was spectacular as we flew by, with bolts of lightning and a light show provided by the setting Sun. Most folks didn't get to see the light show because the stewardesses had asked us all to close our sunshades so that others could see the movie better. What a shame!



Day 2: Sunday June 17th, 2001. Leaving New York



We landed in Newark, New Jersey very late, and spent the night with our Grandfather. At right you can see a drawing of our family's crest, which hangs in his house (left).

The next day we drove through New York City to John F Kennedy Airport. Below is Manhattan from a distance. The World Trade Center's Twin Towers are near the left edge. We never imagined that this would be the last time we saw them standing...



There was a lot of traffic on the way to the airport, and we arrived later than we had planned. All of the window and aisle seats



were taken, but we were able to get bulkhead seats for more legroom. When we saw the plane for the first time we realized that we must really be going somewhere far, because this plane is BIG!

We sat down in the waiting area and were discovered by other members of our tour group. They recognized our luggage tags, marked with the Astronomical Tours logo, and introduced themselves. This was really nice because then we would know who to hook up with upon arriving in Jo'burg.

Day 3: Monday June 18th, 2001. Arriving in Johannesburg

The flight from JFK to Johannesburg, South Africa took an interminable 15 hours. I (Fred) maybe got one hour of sleep I was so uncomfortable. An aisle or window seat makes a huge difference, those middle seats are terrible. We collected our bags and cleared customs, and arrived into the public area of the airport, surrounded by taxi and bus drivers trying to find clients. (We recommend the Magic Bus, if you can cope with the big red lips painted all over the sides. <http://www.magicbus.co.za>). Playing over the PA system was the pop radio version of Lee Ann Womack's "I Hope You Dance". They had just started playing this on the radio back home, and they already have it over here?! Our stereotypes were being smashed by the minute.



That photo was of our group just after getting off the plane, as we were loading our bags into the tour bus that took us to our hotel.

On the way to the hotel we got a glimpse of one of the three downtowns in Johannesburg. The one at right is almost deserted; all of these office buildings are largely vacant except for the first floor shops. When Apartheid ended all of the white businesspeople fled the area in fear. The faceted, mirrored building was owned by DeBeers, the diamond company. At



left is a shot of a squatter camp, like the one bulldozed by the government shortly after we left (this might actually be the one, I couldn't determine). Below you can see a typical neighborhood, with everything from shanties to tract homes.

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Day 4: Tuesday June 19th, 2001. Johannesburg, Soweto, and Pretoria

Soweto

In the morning we took a tour of Soweto, the South West Township, where blacks were clustered. This area has houses that



range from cardboard shanties to millionaire estates. At left is the central marketplace, where



all the minibus taxis come from and go to. This was the slow part of the day, so it was relatively uncrowded. Occasionally there would be cries of "Shoot me! Shoot me!" because the locals are very photogenic and love having their picture taken.

Minutes away is Mandela Village, many acres of the poorest of the poor. They live in shanties built from whatever is available. Many of the building materials were obtained through "midnight shopping". Every shanty has a number painted on it, denoting that family's place in the waiting list for government housing.



These people live in the poorest of conditions, and yet they were extremely friendly and inquisitive. We never felt unsafe or threatened, although there was a lot of begging occurring.

In a better part of town is a school for the local children. The children put on a song and dance for us in exchange for a donation. We think it's a good trade, the school is bright, clean, and cheerful. The main classroom is a brightly painted old school bus, which fits perfectly along with the tradition of reusing materials here.



Our guide for the day was George, seen below with our group beside Winnie Mandela's heavily guarded house. This is in a more upscale part of



town. The joke about cars here is that the BMW means "break my windows", because only BMWs are worth stealing. Across all of Soweto, we saw as many BMWs as bicycles.

Below right is me, in front of Nelson Mandela's former house. This is yet another place where I got in trouble

for taking pictures when I shouldn't have been (it happens on every trip, completely by accident). The house is reconstructed, it had been bombed and only the bottom few rows of bricks are original. The inside is wallpapered with photos and articles on Nelson Mandela and his family.



On the way back we passed a meat market. This was the clean one; the one next door kept all the meat on the ground. This was in such stark contrast to the health rules and regulations back home that we simply could not believe that this meat was intended for eating!



Pretoria



In the afternoon we toured Pretoria, the administrative capital of South Africa. This is Paul Kruger's house. Kruger was the Dutch (Africans pronounce it "Dajj") ruler around the last turn of the century. In his time this street was off limits to Africans.

Near the center of town in a park is a statue of Kruger, seen below with a palm-treed government

building in the background. Below, and looking in the opposite direction, another old government building was visible.

We also visited the Melrose House (bottom right), where a treaty was signed that ended the war between the British and Dutch. The building is packed with antique furniture. Long ago the building was



bombed in an attempt to destroy the table upon which the treaty was signed, but the ill-informed attackers bombed the wrong room and the table survived!



The Union Buildings are shown at right, full of symbolism and similar in purpose to the US Capitol Building in Washington DC. The grounds and the building are off limits to all and this was the closest we could get.



After emerging from the Monument and waking up, we were treated to a fabulous sunset view of Pretoria from the steps of the Voortrekker Monument. In the distance on a hill near the upper right you can see the Union buildings. The number of covered wagons on the wall around the Monument match the number of original Dutch families (or some such symbolism, it was hard to remember all the facts thrown at us.)



Our last destination of the day was the Voortrekker Monument (left), which celebrates the triumph of Dutch settlers over native Africans. It is now politically incorrect, and the place was almost deserted except for a few Japanese tourists. It houses a carved stone mural that depicts people and events. Our guide George went through every panel, explaining all of the symbolism and naming every person. Nearly put me to sleep, which is funny considering that in college my minor was in history...



That evening many in our group met for dinner in one of the hotel's restaurants. We weren't adventurous enough to try the Thai restaurant so we opted for the "regular" restaurant. The waitress took our orders, but with some difficulty.

We then started introducing ourselves and swapped stories. We learned a lot from each other, including myself who learned that you should never try to impress a travel agent with where you have been. You will not win. I recalled one of the most obscure places I have ever been: "I once ate at the northernmost Denny's restaurant in the world, in Fairbanks Alaska!!" Travel agent: "Did they give you the certificate? That certifies you've been there? Sometimes they run out of them towards the end of the season". Me: "What certificate?!"

Then the same waitress returned, and asked us all for our orders again. What? We obliged, and returned to our discussions. A while later, we saw her standing nearby, pointing and talking to herself. We read her thoughts: she wasn't sure who had ordered what. This looks bad. It's been over half an

hour, and we decide to be grateful for whatever we get.

After more time had passed, we inquired about our food and were told it was coming soon. It finally came, **almost an hour** after ordering it, and as expected there was confusion about what dish each person was supposed to get... at least we got our food.

Later that evening Susan (our travel agent/guide) and her husband David hosted a star party from the balcony of their hotel room. A star party is a BYOT event (Bring Your Own Telescope), where people help each other see the sights in the sky and swap tips and ideas. We saw many things despite the intense light pollution (the purple background). We were very disoriented and it took a while to figure out where everything was. In the Southern Hemisphere, everything is upside down as compared to back home. We only located our targets after some mental gymnastics.



Day 5: Wednesday June 20th, 2001. Johannesburg to Livingstone, Zambia

The next day we flew from Johannesburg to Zambia aboard a chartered DC3 built in 1941. The pilot is older than the plane, the toilet is incomprehensible, the emergency placards spell "Emergency" wrong, the ride is sickeningly rough, and parts seem to have broken off the wings (below left), but gosh this is a great plane, really! I really came to love it, it has a lot of charm to it and it is built like a tank. We felt perfectly safe after the first hour, in spite of what



we overheard from the plane's mechanic, who was swapping plane crash stories with a member of our group in the back of the plane!

There was some ground fog around the airport which we quickly got above. I snapped the picture at right shortly after taking off from the Johannesburg airport.



Later in the flight, every eclipse chaser's worst nightmare was appearing...



clouds. Lots of them (left). We crossed our fingers and trusted the almighty: Jay Anderson, the Canadian meteorologist whose comprehensive weather analysis predicts an 80% chance of good skies on eclipse day. That's about as good of a chance you can get in eclipse chasing.



Lunch on board the DC-3 was meager and unrecognizable aside from the Coca-Cola, but even it came in cans unlike any we've seen before. The egg-roll type item on my plate is a traditional African food. Note to fellow American travelers: two magic words exist that will keep you from going hungry wherever you are in the world, no matter what the local language is:

1) "Coca-Cola." 2) "Pizza." Another universally understood magic word is "MasterCard."

Because this isn't the USA, and because it is a charter plane, we were welcome to come up to the cockpit and chat with the crew (right). Top and center on the panel is a state of the art Garmin GPS receiver, a near necessity in the African bush where landmarks are few and far between.



We were surprised to see many roads, trails, and tracks while flying over the bush. We did not fly over the vast stretches of uninhabited lands which Africa is famous for. We flew just east of the Kalahari Desert, made famous in the movie "The Gods Must Be Crazy." At left is a river, winding off to the east. We couldn't determine if the river was dry or just dirty brown water.

At right is a shot of the entire cabin. Most passed the time by sleeping, some like myself were videoing and taking pictures for most of the flight.



Left: A little in-flight maintenance. Extremely cold air was shooting out of the vents, and one was stuck blasting into someone's face, so the copilot (yes, he's older than the plane too) came back to fix it, by stuffing some napkins into it! Now that's service!

We landed safely in Livingstone Zambia, next to Victoria Falls. We flew right over the Falls on the way in, but we did not get any decent pictures. Don't worry, we got a spectacular picture when we left.

We walked right through customs thanks to our group leader's excellent arrangements. Another group spent an hour and a half declaring every camera, every lens, every little thing they had brought.



On the drive to the hotel we were abuzz with excitement; the landscape was like something out of a movie. This was exactly what we had all pictured Africa to be like. There were road repair crews working without machinery, members of the Zambian Air Force jogging in formation and animals being escorted along the road.



Our tour operator in Zambia, Bushtracks, gave us packets with info on the eclipse, eclipse viewing shades, and some small souvenirs - carved animals. I got an elephant.



Upon arrival at our hotel, the Zambezi Sun, we were greeted with a cocktail (tropical punch, we think) and a washcloth. The architecture of



the hotel was amazing, the mood and decoration were so African that we were instantly taken with it.

Above is a photo of the front desk, to the right is one of the waiting area, and below is the pool, which give an idea of the decor.



The hotel is similar to a Sandals resort in the Caribbean according to our tour guide Susan. It has a large pool, and a themed buffet for a restaurant. In the evening a live band plays American pop music on the stage next to the pool. As for the landscaping, one member of our group spotted poison oak planted like you would plant a rosebush! The hotel is very new, less than a year old.

After a quick freshen up we walked over to Victoria Falls. A mile wide and 300 feet tall (twice as high as Niagara), you can't see all of the falls at once from the ground.

Below, we had to cross a very wet bridge. Pouring, driving rain.



At right is a magical spot. The mist obscures a lot of the view, and you have to wait a long time for just the right moment to take a picture.

The mist is actually not a mist like at Niagara, but more like a pouring, driving rain when it hits you. Our complimentary rain ponchos were very appreciated.

Turning around (below), we can see down the canyon to the Zambezi River and the railroad/car bridge between Zimbabwe and Zambia. This bridge is famous for bungee jumping.



We had to be careful to keep our cameras from getting wet. Several times we had to wait for the rain to blow in a different direction before we could take a picture. I can't imagine what it must be like during the rainy season!

Hi everyone!





On the way back we met a group of Vervet Monkeys. They are dangerous but seem so cute.



Later in the evening we had an impromptu star party next to the pool (lower right), to check out our equipment before the eclipse, and to enjoy the Southern sky. The sky was much darker here and we had a lot of fun. We now had the hang of locating things and could point out the Southern Cross and Jewel Box (pictured at upper right), and many other interesting objects not visible from home.



Day 6: Thursday June 21st, 2001. Eclipse Day. Livingstone to Landless Corner & back

We flew to Landless Corner, Zambia to view the eclipse. Landless Corner is a farm owned by Ron and Megan Landless. At this location we were about 100 miles from the turbulent Democratic Republic Of The Congo (formerly Zaire).



At left is an aerial view of the part of the farm we visited. We were at the right edge of the photo next to the line of trees in the middle.



What is a total solar eclipse? Well, through an amazing coincidence in geometry, every few years the Moon blocks out the Sun creating a solar eclipse. The Sun is 400 times the size of the Moon, and 400 times as distant, so they appear to be the same size when viewed from Earth. When the orbit of the Moon takes it between the Sun and the Earth, the shadow of the Moon is cast upon the Earth. If the Moon is close enough to the Earth, someone located near the middle of that shadow will see the Moon exactly block out the Sun in a spectacular show. This is a "Total Solar Eclipse", arguably the most spectacular show in astronomy that happens regularly.

Total Solar Eclipses (TSEs) happen every few years, in strips laid across seemingly random parts of the globe. This time southern Africa was the place to be on June 21, 2001.

There were approximately 50-100 different tour companies offering trips to see the eclipse. We had some tight time constraints; Monica's high school graduation on one end and our Grandparent's 50th wedding anniversary on the other. This left us with just a few trips to choose from. We then settled on the Astronomical Tours expedition. Traveling with kindred spirits was a big plus.

E-Day (Eclipse Day)

Our day began in Livingstone, Zambia at the first-class Zambezi Sun hotel, adjacent to Victoria Falls. We flew to Landless Corner on the Victoria, the sixty-year-old DC3, and landed on the grass strip prepared by the Landless family. We picked out our observing site, near some shade trees, and began setting up. I was fully set up in 10 minutes, but other folks took 1-2 hours to get going. Preparation and simplicity pays off big time in a place like this. Other members of the group had suffered problems like a broken ETX telescope mirror, a broken tracking motor, and so on. I had no equipment damage on the trip until the last day, when a small bug crawled between the glass elements of the lens in my digital camera. Don't ask how it did it! It cost \$155 to fix.



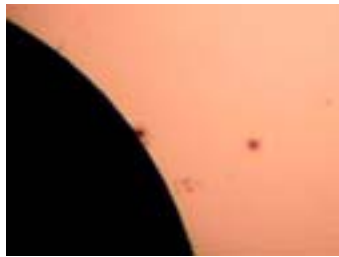
First Contact

The eclipse started with "First Contact", when the Moon begins to cover up the Sun. There was a lot of excitement in our group when this happened. We tried to figure out who saw it first in typical guy behavior. First contact is a reassuring event because it proves that those funny scientist types really did predict the eclipse correctly. Members of our group spotted first contact less than 15 seconds after the predicted time. Special filters are needed to enjoy this part of the eclipse (left), as it is unsafe to stare into the Sun with the naked eye. The image at right was taken seconds after first contact. Can you spot the Moon's silhouette?



Hint: at eight o'clock there is a dent in the Sun.

As the eclipse progressed more and more of the Sun was covered. Members of the group had great fun letting people look through their telescopes at the Sun. We were especially keen to let the locals look, as they were very superstitious about the event by all accounts. There were some nice sunspots that added interest as the Moon crawled across the Sun. Next page is a closeup. You may notice that



the silhouette of the Moon is somewhat ragged and rough; these are the actual mountains and valleys on the Moon. The dark central spots of the two largest sunspots are each about the size of the Earth.

We all went on a hunt to find the best object to



project crescents with and onto. The winning combination was a coarsely woven hat and the back of my white shirt, on which you could see

hundreds of tiny sun crescents. Closer to second contact, we saw some birds flying by and acting like it was evening, though it was about 2:30-3pm. Second contact is the biggie, when totality and the real show starts because the Moon has covered the Sun completely.

When the Moon covered all but a tiny sliver of the Sun, the Diamond Ring effect appeared. We removed our filters and had some gorgeous views of it.

Totality

The end of the Diamond Ring marked Second Contact, the start of Totality, when the Moon has completely covered the Sun. Our group, mostly amateur astronomers, went to work photographing and observing various phenomena. Other groups could be heard shouting and cheering in the distance. About 350 people were at the Landless Corner farm, so there was a pretty good noise.

The sight of the corona (whitish wispy streamers) and large prominence (reddish "flames") was simply amazing.



The corona was fairly short, with most of the light bunched up close to the Sun and no long streamers. We could see the planet Jupiter nearby, and the star Sirius above. I think there were other stars/planets visible, but I didn't take the time to figure out what was what and remember them. The sky was not completely black, but rather a dark blue-gray, changing to golden red all around the horizon. Below are closeups of some of the prominences that were visible.

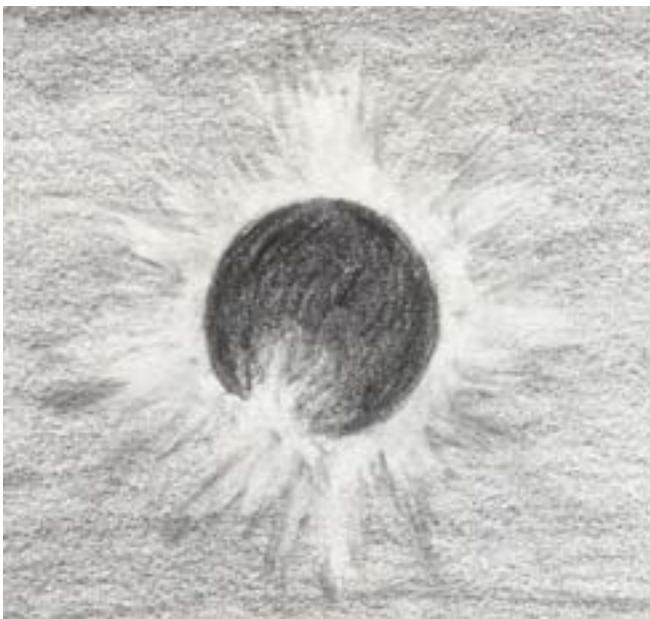




Our plane and flight crew, back from refueling in Lusaka, didn't make it onto the ground in time and witnessed totality from the air. The sight of the magnificent DC3 arcing just in front of us and under the fully eclipsed Sun was a beautiful sight, I wish I could have captured that. The copilot later told us of how he was caught off guard by the extreme darkness and was scrambling to turn on lights. They were able to bank the plane and see the eclipse pretty well. I'm sure that flying a historic aircraft while watching the eclipse was a highlight of their careers.

We could see the western horizon brighten, signaling the approaching end of totality. Totality lasted 3 minutes and 34 seconds at our location. I simply could not believe how fast those minutes went by. It felt like five seconds. My carefully laid plans for photography went completely out the window because there simply was no time! For other photographers out there: practice, practice, practice, until you can do your routine without thinking. Your mind will be on the amazing things you are seeing. Also, learn everything by feel; it's dark!

Totality was followed by another Diamond Ring at third contact, when the Moon no longer completely covers the Sun, the end of totality. This signals the end of the big show. The cheering and shouting from the distance rose up again and continued for a while.



Monica sketched this wonderful drawing of the eclipse at this point.

After totality we talked and shared impressions. Some folks got drunk. Monica was somewhat ambivalent towards the event, as she is not astronomically minded. A long steady line of cars and trucks that lasted half an hour came up on the Great North Road (northbound, presumably they were closer to the centerline) honking their horns and shouting. Some of the planes at our airstrip took off soon after totality ended, kicking up a lot of dust. It was probably less than ten minutes after totality when the next TSE (December 2002) was mentioned, and we had a good discussion on whether to go to Africa or Australia for it. Africa



will be in the wet season, Australia has only 30 seconds of totality. It's a "lesser of the two evils" type of decision.

The eclipse didn't end with third contact, the Moon still had to move off from the Sun. One member of our group commented that the partial phases after totality are probably the least observed astronomical phenomenon there is, and we believe him. I was probably the only person in the group who kept shooting all the way to fourth contact, when the Moon moves off the Sun completely and everything returns to normal.

Our group stayed around until fourth contact, and then packed up and flew back to Livingstone, tired but satisfied. The day ended aboard the DC-3 with a beautiful sunset. It was hazy from all of the crop fires, and after sunset we could easily see the flames below. Made for an eerie ending to an amazing day. Thanks to digital technology, several of us shared our pictures of the eclipse on the way back. If we had coordinated more and brought the right cables, we could have swapped pictures, transferring them between cameras.



Partial Phases Photo Plan		
1st contact	11:41:05	14:27:00 4th contact
0'	11:41:05	14:27:00 0
5	11:45:29	14:23:17-6
10	11:49:52	14:19:33-10
15	11:54:16	14:15:50-15
20	11:58:39	14:12:06-20
25	12:03:03	14:08:23-25
30	12:07:26	14:04:39-30
35	12:11:50	14:00:56-35
40	12:16:13	13:57:12-40
45	12:20:37	13:53:29-45
50	12:25:00	13:49:45-50
55	12:29:24	13:46:02-55
60	12:33:48	13:42:19-60
65	12:38:11	13:38:35-65
70	12:42:35	13:34:52-70
75	12:46:58	13:31:08-75
80	12:51:22	13:27:25-80
85	12:55:45	13:23:41-85
90	13:00:09	13:19:58-90
95	13:04:32	13:16:14-95
100	13:08:56	13:12:31 100
2nd contact	13:08:56	13:12:31 3rd contact

As for the equipment I took to photograph the eclipse, I had a Sony DCR-TRV120 Digital8 video camera with 25x optical zoom on a tripod, and a telescope with digital camera. The telescope was an Orion ShortTube 80mm F/5 refractor, modified to place a 1/4-20 socket further back, closer to the center of gravity when the digital camera was attached. I used an Orion solar filter for the telescope, and Baader AstroSolar film on the video camera. Attached to the telescope was then a spacer (actually an empty eyepiece projection adapter) and eyepiece projection adapter, with a 2x Apo Barlow and cheapo 25mm eyepiece inside. This connected to a T-to-49mm adapter, to a Lensmate adapter, to my Canon Powershot G1 digital camera. The G1 had an IBM 1GB Microdrive inside to make sure I would



have space for all the pictures I wanted to take. I did actually run out of space on the Microdrive before the end of the trip and had to delete pictures. I had purchased a bunch of spare batteries also. FedEx and UPS love me.

The telescope and digital camera combination took many weeks to figure out. I wanted to be able to zoom out to get the corona, and zoom in to see sunspots and prominences. The difficult thing was getting the camera lens close enough to the eyepiece, and finding an eyepiece with glass right at the top with no eyecup. I used the IR remote to fire the camera instead of a cable release, and took advantage of the camera's AEB (Automatic Exposure Bracketing) feature extensively during totality. Over the entire trip Monica and I took about 1,200 digital photos, 125 film photos, and 3.5 hours of video. 225 photos were of the eclipse itself (through the telescope).

Aside: Southern Hemisphere Observing

While on the tour our group had several star parties, some quite impromptu. The sky from Johannesburg was pathetically bright, just like any major city in the USA. The skies were much better in Livingstone, Zambia, but the best skies were inside Chobe National Park, Botswana (at the Chobe Game Lodge), which is in the middle of nowhere. We could see Omega Centauri easily with the naked eye from all locations, and greatly enjoyed looking for various objects that are below the southern horizon from home. Mars was high overhead, as was Scorpius and Sagittarius. Chobe was easily a 6th magnitude sky, but we were very restricted in where we could observe from due to the animals.

I spotted the Moon the day after the eclipse, when it was about 27 hours old, just after sunset in Chobe while we were on a game drive. The next day I took this photo of the two-day-old Moon with my telescope and digital camera.



Day 7: Friday June 22nd, 2001. Livingstone to Chobe National Park Botswana.

The day after the eclipse, we got up early to go on a Rhino Safari. We were driven to Mosi-Oa-Tunya Zoological Park, a preserve not far from Victoria Falls on the Zambian side. The morning was unseasonably misty (maybe because of the eclipse the day before) and we did not see much at first. We got really excited when we saw this... a tiny herd of Impala. These are essentially the African

equivalent of deer, but a little smaller. By



the end of the trip we had seen so many that we made jokes about not wasting film on them. They seemed to be absolutely everywhere.



This is the first white rhino that we saw. It was one of two; a mother and her son. There are a total of five rhinos being protected in this park. We can honestly say we saw 40% of the Rhinos in this area (2 of 5).

I think we were fortunate to get a good guide. There was another guide showing a different group through the park,



and our guide tried to radio to him where our rhinos were located:

Our guide: "I'm saying... you remember where we go with the ... yesterday?"

Other guide: "Affirmative."

"Yes, the route we use when going back. Yes, the one we used for exit."

"I just uh, just uh, stand by."

"You remember last time the rhinos? Then we drove straight with that road, that's the road I am in."

They then continued the exchange in their native language. It was clear that the other guide had no idea where we were. Eventually he found us, many minutes later, and after a lot of explaining from our guide.



(Above) The Damage done by some elusive elephants! We saw what they did but we never saw elephants until we got to Chobe.

The only zebras we came across during the whole trip were here. My guess is that they survive here because there are no predators. All of the lions are across the river in Chobe.



For a short break our guide stopped at the banks of the Zambezi river so that we could get out and stretch our legs. He says it's safe but this looks like crocodile country to us. At left is a picture of Monica by the Zambezi River. It's really cold, and she's not a morning person! Good thing the guide gave us ponchos.

To the right is our guide showing us where a rhino had charged him and damaged his Land Rover! Apparently, he had his back to the Rhino while talking to a group and the thing just slammed into the vehicle! You can see the scratch marks along the side as he drove away with the Rhino still pushing. The Rhino's horn punctured the car just to the left of the front wheel.



At left: we got up close and personal with some animals, like this bird. I think it was some kind of kingfisher, but I can't remember. On the same tree was this interesting spider web.



Some wildlife was close up, some was far away. To the left are warthogs at the edge of a swamp. They are the brown things in the dead center. Don't worry, we've got a much better picture of a warthog later on.

At right: We drove right by this the first time, and would have missed it if



Monica had not been looking backwards out of the Land Rover. It's a giraffe, hiding behind a bush. Ten feet away and nobody saw it! You can see why, he's very well camouflaged. Look for his upside-down shadow, near the bottom of the picture. It leads to his legs.

A wonderful herd of wildebeest!



Baboons below! These guys were really neat, and we never realized how large they were until we saw them running across the road. Some were about three feet high.



Hello. A great giraffe pic. Next is a closeup of the giraffe's markings, which are different on each individual.



B e l o w :
Victoria Falls as seen from upriver. Memorize this scene... if you ever see something like this while going down a river, STOP or you might plunge 300 feet!



The photos below and right were taken while sitting in our hotel room. That's right, this was our view, complete with scavenging monkeys (see lower right on tree trunk).



Chobe National Park

We left the hotel around lunchtime, to fly to Kasane Botswana, and then drive to Chobe National Park, Botswana. After takeoff our Captain got special permission to fly over the Falls, which gave us a spectacular view. Check out the picture at the top of the next page. Remember that the falls are a mile wide and 300 feet tall - twice as high as Niagara. The pink buildings past the right edge of the falls is our hotel. The bottom and left of the photo is Zimbabwe, the right is Zambia.



Elephant crossing. Funny, nobody told them the light was green! Image getting off a sixty year old plane, into an open Land Rover, and this is what you see. Amazing!

You are now entering the wonderful Chobe Game Lodge, the real Jurassic Park, famous because



it was the site of Elizabeth Taylor's wedding to Richard Burton.



Below is one of the warthogs that live on the hotel grounds. They are always in your way. Not exactly



as smooth as the baby's bottom. Monica thinks these warthogs have a good life at Chobe.

Most of our time at Chobe was already planned out for us (left).



The great advantage to staying inside the park is that no time is wasted getting to where the animals are. We could hear lions roaring while lying in our beds, and elephants are often on hotel grounds. It is not safe to walk outside your room at night. The only thing between you and the lions is a three foot fence, and there is no gate on the driveway.



We're up for a game drive right after arriving, and ahh, it's the elephants again! This time it's a water crossing.

Below: A young elephant is taking a mud bath. Very good for the skin I'm sure! The younger ones pre-



fer the damp mud to the dry dirt that older elephants bathe in. We were amazed at the ability of the elephants to use their trunks. They could pick up dirt or mud and throw it to a specific place on their bodies. Often they would use a foot to kick dirt into their curled up trunk.

At right: We got charged by a baby elephant! Isn't he cute though? We were charged by elephants at least six times that we could think of. Usually it was a mother elephant objecting to our proximity to her offspring.



(Left) After drinking and eating on the river, the elephants come ashore and supplement their diet.

(Below) How close do you get? This close!

These are African elephants. Their ears are shaped like Africa, and have smaller tusks than Indian ones because of the difference in nutrients in their food: tusks here are weaker and break easily.





Lion crossing!
 These cubs were crossing to catch up with mom. There are about 25 lions in the park (which is about the size of



Yellowstone), and most of these lions are concentrated around our lodge. We saw them every time we went on a game drive.

At right is a group of impala. These are all female. The males have horns. Some in the group were lame from injury. We spotted two with broken legs. They won't last very long with those lions nearby.



Two plovers (birds) had laid a nest in the middle of a road. The guides set up some branches around the nest so it wouldn't get run over.



Right: The remains of a feast. This buffalo's skull and a few other bones were all that remained.



Our guide knew just where to go to find giraffes. The two below were practicing fighting. On the left is a closeup after they stopped the play fight. Compare the pattern of spots on this fella with the one on page 23, who was on the other side of the Zambezi River.





A beautiful sunset after an unreal and wonderful day. Other vehicles are kicking up some dust.

Day 8: Saturday June 23rd, 2001. Chobe National Park, Botswana.

At right: looking out across the Chobe river, birds take off just before sunrise.



There are about 25 lions in Chobe and a lot of them have collars so they can be tracked. The male lion is named Scottie (below, with mane). Scottie has an unnamed brother with no shame; in the evening we found him sitting at the side of a road. We stopped, and he walked around behind our Land Rover and back up to the front where he promptly began taking care of his business... #1 AND #2.



One morning we went out to try and see the lions make a kill. There was a very interesting drama between them and these water buffalo (below), but no kill. We had a unique experience: in the course of maneuvering our Land Rover to give us the best view, our shadow fell across the lions. I have been to Africa, and I have cast my shadow upon the king of beasts.



Of course, the lions caused a "wildlife jam" of safari-goers, all clamoring for the best view. It was pretty comical, with each driver trying to get their passengers the perfect shot. Each time someone moves they block the view of someone else...



The sideshow to all this was the lion cubs, frolicking around and play fighting.



On the way back from seeing the lions we spotted this interesting bird.



Next up was a water safari. The lodge has quite a few watercraft. This was one of the smaller ones.



We headed south along the river. The elephants were often by the water. They love it!

Below left: Here's a new friend, a grazing hippo! Hippos are very temperamental animals. It's best to stay away from them.



My what big teeth you have. We saw many crocs, there is no sunbathing on riverbanks here! Despite their lazy demeanor, these crocodiles can move very

fast when they want to. Elephants and crocs leave each other alone.



Those elephants love to play! This particular pose inspired some jokes... but they were just roughhousing.

We also saw a monitor lizard on the banks of the river. He's about three feet long.



An eagle-eyed member of our group spotted

some antelope (below) far up the river, which turned out to be Sable antelope, a very rare sighting!



No, that's not a Bald Eagle, it's an African Fish Eagle. Notice the white breast below the neck.



Next to him is a colorful bee-eater.

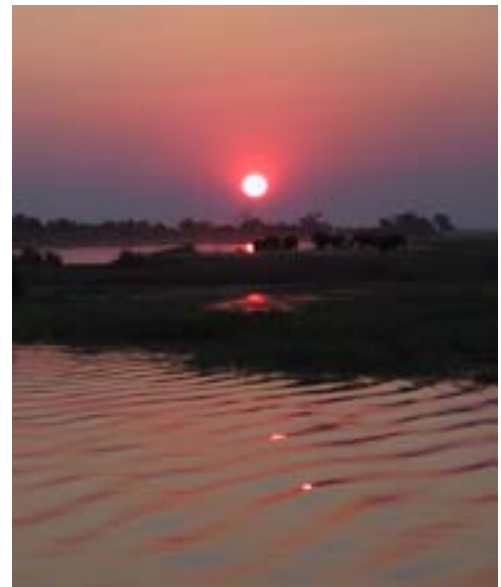


At right: a Yellowbilled Stork. An invaluable aid to keeping all of these animals straight was the complimentary guidebook prepared by the lodge. Two free copies in every room! When you're paying almost \$300 a night you deserve to get perks like this! (Actually, we got a deal as a group and paid substantially less than that). Here is our fabulous hotel as seen from the Chobe river. It was a very nice place but did have a bug problem. Little beetles had taken over our bathroom. Every room had them, but ours was the worst.



We found that the best place from which to observe the sky at night was near the white umbrella above. This is a private patio area that the hotel staff can unlock upon request. At left: the view from our room.

The sundowner cruise was amazing. They found some elephants and placed the boat so that the elephants were between us and the Sun for some beautiful photo opportunities.



While walking back to our room after dinner, we heard loud rustling coming from the bushes on the other side of the fence about 50 feet from the door to our room, across an open grassy area. The fence is only three feet high and is a total joke, so we scurried into our room and locked the door. We peered back out with flashlights, but couldn't determine what the noise was.

We found out the next morning: it was an elephant. A BIG elephant. It had made its way onto the compound. Late that night one of the members of our group was returning to his room, a few doors down from ours, and ran face to face into it. It was blocking the way to his room! He had to get help before he could even get into his room. Sleepwalking here could be fatal!

Day 9: Sunday June 24th, 2001. Chobe National Park, Botswana.

Every day began at the inhumane hour of 5:30am. It took so much effort for us to get going after the packed and almost exhausting day before. One thing that really took some adaptation was the fact that breakfast isn't until you come back from your first game drive. But we managed to survive, and it was always worth it. You see a lot of activity right around sunrise. For example, hippos come up on-shore quite a distance at night, and so around sunrise is the only time you can see them out of the water, when they are returning to the river.

Crikey! Monica sees a Croc!

Below: A closer look. The Croc is across the river from our hotel. Across the river happens to be Namibia, as the Chobe river is the border between Botswana and Namibia.



Below are two Kudu. These are females; again, the males have horns. We may have eaten Kudu.



Below: When you gotta go, you gotta go. These two Japanese tourists would have been lion lunch if they had stayed much longer.



There were a lot of meats at the dinner buffet that were beef-like and chicken-like but otherwise completely unidentifiable. You could also order from a menu, which definitely listed kudu, along with buffalo and other meats. Monica and I weren't adventurous enough to try it. We should have... You don't often get opportunities like that.



Left: vultures wait for the lions to finish eating their kill. The lions are out of sight behind the bushes.

Below is a bushbuck, a shy and rare animal, they can be hard to spot. Like the Sable Antelope, these sightings take determination and luck.



(Left) A beautiful African sky.

(Below right) Too close for comfort? At Chobe, it's not an issue of "how close can you get to them", but an issue of "how close will they get to you"?



Above: elephants in the road, and a hippo takes a yawn. Check out those teeth!

The guides/drivers would do anything for us. One of the people in our car wanted to see giraffes, so our driver drove us much further into the park than we had been on previous drives, to see these great giraffes. There were places southeast of Serondela where you could see twenty or more at once, much closer than this picture on the right. Serondela is on many maps and you might get the idea from the



maps that it is a real town, when in fact it consists of not much more than two huts and a water tank. That qualifies it to be on the map! At left is the road marker to Serondela.



It is hard to believe that at this peaceful place we are only about a hundred miles from civil-war-torn Angola. Dotted along the Chobe River are the remains of military watch towers, left over from a dispute between Botswana and Namibia over control of the Chobe River.

We also had some free time to sleep, shop, or take optional activities. Susan, being a travel agent, decided to take a boat across the river into Namibia to check out the sister lodge to the Chobe Game Lodge, the Chobe Savannah Lodge. This is where we were going to stay originally. So off she and a few others went to check it out (right). They had to clear Botswanan and Namibian customs both ways, and as luck would have it the customs office (er, customs HUT) closed for the night before they could get back! They snuck back anyway, so technically they were in Botswana illegally that night! What can you do?



I decided to embark on the “Four Corners Tour”, because very close by is a very rare (unique?) location where four countries come together. There is a place in the middle of the Zambezi river where you can be in four countries at once. I really dig that kind of obscure geography trivia stuff. However, somehow things got a little confused and before I knew it we were driving to the Zambian border crossing, instead of walking to the boat to go down the river. Huh? Things can get confused out here. Seems the Four Corners is off, but now our driver Ali offers to take us to Zimbabwe to get our passports stamped as a consolation prize. No visa or fees are necessary they say. We had asked other people about this earlier, and they all agreed that we wouldn’t have to pay.



So off we went, stopping only to look at the waterbuck (left), which no longer can live inside Chobe park because of the lions. We arrive at the

border, are stamped out of Botswana, and cross to the Zimbabwe side. The young border officer delivers stunning news: he’s not amused with our simple desire to get passport stamps, so he won’t stamp our passports for free, and it’s not free to cross into Zimbabwe, it costs \$20 US. We consider it, as we could go in for half an hour and come back, but he won’t even let us do that! He will only let us through if we are going somewhere specific in Zimbabwe! Ugh. We take some pictures at the gate (right: Fred with excellent driver/guide Ali) and return to Botswana with our tails between our legs. Oh well. Little did we know that we would be back the next day...



Day 10: Monday June 25th, 2001. Chobe, Botswana to Vic Falls, Zimbabwe.

Stranded in Zimbabwe

The next day we promptly packed up, checked out of the hotel, and went into the town of Kasane to kill some time. At right is a picture of the Land Rover we had been driving around in the past several days. I took the picture while waiting for the women to finish shopping...



After a couple of hours we headed for the airport. It’s a

charter plane, so we could leave whenever we were ready.

We arrived at the airport but there was a problem... no plane. Believe me, Victoria, our DC3, really stands out and you notice when she's not there. Our plane is nowhere to be found, and even the airline doesn't know where the plane is. This is bad. Many group members have "can't miss" plane connections.

There are no other flights out of Kasane airport in the direction we want to go (this IS the middle of Africa), so a scheme was hatched to drive overland to the town of Victoria Falls, Zimbabwe, where the air connections are better. Great. I spent a lot of time to find a tour that didn't go to Zimbabwe, because the country is having many problems. We had no choice, so off we went.

On the road to Vic Falls we saw a small plane that had crashed two days earlier. It was lying in pieces at the side of the road. Three people died in the crash, which was blamed on insufficient fuel. Our flight crew (of the DC3) were the ones that witnessed and reported the crash, and they dispute the official story. Before takeoff they had seen the small plane having engine problems, to the point where the ill-fated passengers did not want to fly in the plane. This really reinforced that we are in third-world countries here.

Upon arrival in Vic Falls, we learned that only six of the group's thirteen people could fly out that day. We (Fred and Monica) had a day of slack in our plane scheduling, and so we spent the night, to catch the next flight out tomorrow. We learned that our plane (the DC3, Victoria) was here for engine repairs along with the flight crew we had gotten to know so well. At right we can be seen chatting with them while we waited for the ride to our hotel.



Day 11: Tuesday June 26th, 2001. Vic Falls, Zim to Johannesburg, to Sal, Cape Verde.

In Zimbabwe we stayed at the Kingdom, a first rate hotel that even had a casino. There were huge carved wooden figures in the casino (left), which was surrounded by shops and food. A plaque near the entrance commemorates the opening of the hotel by the president of Zimbabwe, Robert Mugabe. Is it just me, or does it say something about a country when their President attends the opening of a hotel?

My fears about Zimbabwe were coming true. The phones didn't work. At best I could get an operator in the USA telling me that I had no way to pay for the call, and at worst while calling the operator I would get a message telling me to call the operator. Great. Did I mention that the fuel prices had just doubled?

When walking along the main street you are

constantly approached by beggars, merchants, and illegal money-changers. You can tell the money changers because they just shout numbers at you like “140! 140!” which is the exchange rate. You can’t change ZimDollars back into US Dollars, so you need to be careful to only exchange the minimum you need, and only exchange at legal places. Note: The hotel will rip you off, giving you an exchange rate perhaps half of what you can get elsewhere.

By this point I was really tired, and a little uncomfortable about showing off my expensive camera gear, so I didn’t take many pictures in Vic Falls.

Believe it or not, we didn’t go back and see the Victoria Falls from the Zimbabwe side. Our rain ponchos from a few days earlier were not easily accessible, and the mist was so bad that we would have gotten extremely wet without them (now we can say that we went to Victoria Falls but didn’t bother to see the Victoria Falls!) After some shopping we headed to the airport to catch our flight to Johannesburg.

We were very displeased with the charter air operator, Debon Air. Their head office was full of people making our lives miserable. They refused to pay for many of our expenses, and we ended up paying about \$200 each out of our pockets to get ourselves out of the country. The flight crew was excellent, but those in charge of the company are a bunch of (censored). Trip insurance paid for the \$200 per head, but only after several months.

In contrast, our safari tour operator (Bushtracks Africa) was absolutely excellent and I would recommend them to anyone.

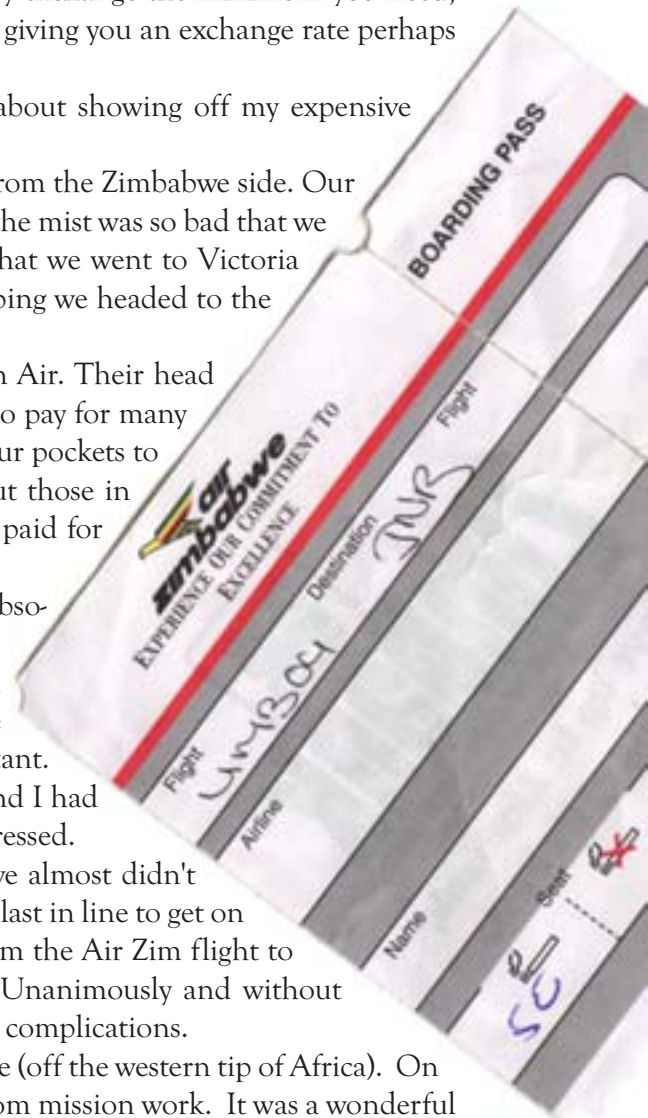
For the connection to Johannesburg, we took a commercial Air Zimbabwe flight. The plane was an old 737-100. Just before takeoff they came through the cabin and sprayed us with disinfectant. The brakes on the food cart used by the stewardess were broken, and I had to hold the cart for her while she prepared my drink. I wasn’t impressed.

In Johannesburg, there were of course more problems and we almost didn’t make it onto our flight back to New York. We think we were almost last in line to get on the plane. We were given the option of hand carrying our bags from the Air Zim flight to the South African flight, or letting the baggage handlers do it. Unanimously and without hesitation we decided to carry our bags. We didn’t need any more complications.

The plane flew from Johannesburg, to Sal Island in Cape Verde (off the western tip of Africa). On board the plane we were surrounded by church groups returning from mission work. It was a wonderful feeling.

Day 12: Wednesday June 27th, 2001. Sal, Cape Verde to Wisconsin.

At Sal Island, the 747 refueled while we ran into the terminal to make a phone call to let everyone back home know we were alive. Less than an hour later, we were back in the air and on our way to New York. At JFK we were met by our father, who drove us to Newark, where we caught a plane to Detroit, and on to Minneapolis, and then drove to Fairchild, Wisconsin, where our other Grandfather has a farm. If we calculated correctly, we trav-



eled for 43 hours nonstop, with about an hour or two of sleep. On the previous page and below left are pictures of our Grandfather's farmhouse and barn.



Below: Flying home to San Diego at sunset, over Minnesota's 10,000 lakes.



Closing

We finally got home to San Diego on Day 17, July 2nd, 2001 at 12:10am.

One of the images I took of the eclipse was published in the October 2001 issue of Sky & Telescope magazine, on pages 6, 128, 129 and 132. They even paid me! It was quite an honor to be published.

The whole trip was fantastic. We saw many, many wonderful and beautiful things. We have now been to 15 countries, and these were some of the most interesting.

The trip was a very rewarding experience, and it was worth every penny, every drop of sweat, every little bit of stress that it caused. I wouldn't hesitate to do it again. There is another eclipse in Africa/Australia on December 4, 2002, and I already have it marked on my calendar. I'm even trying to come up with a way to raise the \$20,000 needed to go see the 2003 eclipse in Antarctica. I love to travel, and it is so wonderful to be able to mix travel with one of my hobbies. Happy travels and clear skies!



It's good to be home... another beautiful San Diego sunset.

Animals We Saw

Mammals (19 species):	Birds (26 species):
Lion	African Fish Eagle
African Elephant	African Hawk Eagle
Impala	Bateleur Eagle
Buffalo	Blackbacked Vulture
Giraffe	Whitebacked Vulture
Hippopotamus	Whiteheaded Vulture
White Rhinoceros	Black Stork
Zebra	Woollynecked Stork
Sable Antelope	Yellowbilled Stork
Bushbuck	Great White Egret
Kudu	Crane
Puku	Darter
Waterbuck	Egyptian Goose
Wildebeest	Helmeted Guineafowl
Warthog	Kingfisher
Bush Squirrel	Woodhoopoe
Branded Mongoose	Whitefaced Duck
Baboon	Blue Waxbill
Vervet Monkey	Fork Tailed Drongo
	Plover (2 types)
Reptiles (3 species):	Kori Bustard
Crocodile	Bee-eater
Monitor Lizard	Spoonbill
Water Moccasin (unconfirmed)	Ibis
	Hammerhead

Countries visited this trip

USA - New Jersey/New York/Wisconsin/Minnesota
South Africa, Zambia, Botswana, Namibia (territorial waters only), Zimbabwe, Cape Verde

Countries visited in previous trips:

USA (37 states including Alaska), Canada (3 provinces), Mexico, England, France, Germany, Austria, Switzerland, Italy, Liechtenstein, Czech Republic

Total countries we've been to: 17
(if you count the USA and Namibia, else 15)

Conveyances/Towns/Cities

From Ramona (home)
to San Diego via car
to Newark via 737 airplane
to Rutherford via car
to New York via car
to Johannesburg, South Africa vs 747 airplane
to Sandton via bus
to Soweto via bus
to Pretoria via bus
back to Sandton via bus
back to Johannesburg via bus
to Livingstone, Zambia via DC-3 airplane
to hotel via minibus
back to Livingstone via minibus
to Landless Corner via DC-3 airplane
back to Livingstone via DC-3 airplane
to hotel via minibus
back to Livingstone via minibus
to Kasane, Botswana via DC-3 airplane
to Chobe National Park via Land Rover
touring Chobe National Park, Kasane, and
Serondela in Land Rovers
back to Kasane via Land Rover
to Victoria Falls, Zimbabwe via bus
to Johannesburg, South Africa via 737 airplane
to Sal Island, Cape Verde via 747 airplane
to New York, USA via 747 airplane
to Rutherford via car
to Newark via car
to Detroit via DC-9 airplane
to Minneapolis via airplane
to Fairchild via car
touring Fairchild/Augusta via car
to Minneapolis via car
to San Diego via airplane
to Ramona (home) via car

Totals:

21 cities in 6 countries
12 airplane flights (737, 747, DC-3, DC-9)
13+ bus/minibus trips
9 car trips
Total transits: 34+

Equipment list

Video camera

- 2 batteries, large and small
- Power brick & cables
- RCA cable
- Spare button battery
- 4 blank Digital8 video tapes (60 minutes ea)

Digital camera

- Power brick & cables
- 4 batteries - charge before leaving
- Microdrive
- Flash card w/ Microdrive case
- Video/audio rca cable
- 1/8" stereo to RCA adapter
- Remote
- Remote battery

Monica's film camera

- 4 rolls 24exp film (Kodak Royal Gold 400) (plus one in camera already)

Telescope & caps (finderscope is being left home)

- Solar filter
- Old eyepiece projection adapter
- New eyepiece projection adapter
- 49-T
- Lensmate
- 45deg diagonal & caps
- Barlow & caps
- 25mm eyepiece & caps
- 7.5mm eyepiece & caps

2 Binoculars (medium size), (mini)

3 Tripods: (large, with separate 1/4-20 adapter), (mini metal one), (mini plastic one)

Miscellaneous:

- Telescope bracket (homemade: metal plate + wood block + nuts + bolt)
- Spare 1/4-20 nut & bolt
- Philips & flat screwdrivers (mini), flat screwdriver (large)
- Wrench/pliers
- Small scissors (carried by Monica)
- Cellophane tape
- Duct tape
- Black electricians tape
- Power plug converter(s) (British & Euro)

Bottled water (about 4 liters per person)

Toiletries

Beach towel

Copies of passports, receipts for cameras & telescope, immunization records

Maps of Southern Africa, Botswana, Zambia, World, Germany (it's a long story...), Newark & Johannesburg airports

Fred's reading material: Michael Palin's Pole to Pole, Robert Zubrin's Entering Space, Scientific American geo-article collection, Sky & Telescope magazine, selected pages of Espenak's eclipse bulletin

Forgotten items:

- Alarm clock
- Sunglasses/hat
- Headphones

Should have brought:

- Satellite phone (would have been wonderful in Bots/Zim)
- Swimsuit
- GPS
- Southern sky star charts & checklist of things not visible back home
- ROUNDED huge three prong plug converter. British plug converter (huge squarish three prong) was useless despite what the guidebooks say
- More storage for digital camera (another 1GB microdrive)
- Decent runny nose medicine
- More tissues
- More bottled water, about 1 liter per day
- Phone numbers of anyone might possibly need to get in contact with
- Email addresses of friends

Should have left home:

Nothing, I used it all!

